

MASSACHUSETTS FLORA: A REVIEW OF
CURRENT DISTRIBUTION AND CONSERVATION
OF RARE SPECIES

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The last time the New England Botanical Club held a symposium, in 1979, my botanical predecessors presented a paper on the status of rare vascular plants in Massachusetts (Field and Coddington, 1980). At the time of the symposium, intensive inventories such as those conducted by Natural Heritage Programs were just getting started. Much has happened since then, as we have already learned today. Although Massachusetts had been heavily botanized for over a century and a half, information on the distribution and abundance of rare species was scattered, out of date, and woefully inadequate in terms of directing protection priorities.

The Massachusetts Natural Heritage Program was begun in 1978 to inventory the state's rare flora, fauna, and plant communities. Limited fieldwork conducted up to and including 1978 had verified current occurrences for 37% of the taxa on the state list of rare plants (Coddington and Field, 1978). Since then, ongoing fieldwork has raised the figure to 80%. Progress in re-verifying rare species was rapid for several years (about twenty species reverified per year), but since 1985 the rate at which "missing" species are found has dropped markedly (less than seven per year).

Forty-five species from the original Coddington and Field list (1978) have been removed from the list due to abundance, taxonomic decisions, etc. Conversely, forty-three taxa have been added to the list, based on current assessment of rarity (Sorrie, 1987b). Ten of those species are new discoveries to the state: *Woodsia glabella*, *Trichomanes* gametophyte, *Thuja occidentalis*, *Carex castanea*, *Carex chordorrhiza*, *Eleocharis microcarpa*, *Rhynchospora capillacea*, *Juncus debilis*, *Hydrastis canadensis*, and *Desmodium humifusum*.

The Natural Heritage Program database now contains 3000 occurrences (= "stations") of 241 rare plant taxa. A map of Massachusetts rare plant occurrences by town shows concentrations in the dolomitic limestone region and the Housatonic River Valley of Berkshire County; the traprock, sandstone, and conglomerate ridges and floodplain habitats in the Connecticut River Val-

ley; and in the Coastal Plain ponds, pine barrens, heathlands, and maritime habitats of southeastern Plymouth County, Cape Cod, and The Islands. Out of 351 towns and cities statewide, 160 support one or more current sites for rare plants; an additional 135 have historical sites only. Areas having few or no rare plant sites are indicative of relatively uniform topography and “ordinary” geology, rather than of less fieldwork. Towns with the most *occurrences* of rare species are in the three areas listed above. Those with the largest *number* of rare species (current and historical) are: Sheffield—50, due to its extraordinary diversity of calcareous ledges and fens, floodplain habitats, and rich mesic forest; Nantucket—43, due to its combination of heathlands, Coastal Plain wetlands, and barrier beaches. Stockbridge and Williamstown follow with 37 and 36 species, respectively. As a county, Berkshire far outdistances the others with 113 species, owing primarily to its extensive deposits of calcareous bedrock.

Major rediscoveries of the state’s “missing” rare flora since 1979 have been numerous, because of dedicated efforts by many knowledgeable volunteers. Also, an ecologically enlightened citizenry has meant that many natural areas have been spared the developer’s plow. Many of the rediscoveries up through 1984 have been documented in *Rhodora* (Sorrie, 1987a) and so today I will highlight some of those and bring us forward through the 1987 field season. In taxonomic order they are: *Polystichum braunii* on Mount Greylock, *Elymus mollis* in Gloucester, *Carex davisii* in Sheffield, *Carex livida* in Lynnfield, *Carex polymorpha* in Duxbury, *Eleocharis tricostata* on Nantucket, *Scirpus longii* in Dartmouth, *Scleria triglomerata* in Northbridge, *Chamaelirium luteum* in Sheffield, *Cypripedium arietinum* on Mount Toby, *Platanthera cristata* in Bristol County, *Triphora trianthophora* in Rowe, *Cardamine douglassii* in Sheffield, *Rosa acicularis* in Lanesborough, *Hypericum (Ascyrum) hypericoides* on Nantucket, *Pyrola asarifolia* in Berkshire County, *Halenia deflexa* in Cummington, *Hydrophyllum canadense* in North Adams, *Blephilia ciliata* and *B. hirsuta* in Berkshire County, *Agalinis acuta* on Cape Cod, *Lonicera hirsuta* in Williamstown at the type station, *Gnaphalium purpureum* on Nantucket, and *Solidago glutinosa* ssp. *randii* in southwestern Berkshire County.

Since the 1979 NEBC symposium, major phytogeographic finds within Massachusetts, in addition to the ten newly discovered species, include *Equisetum variegatum* from Norfolk and Worces-

ter Counties, *Milium effusum* from Franklin County, *Scirpus pendulus* from Bristol County, *Scleria pauciflora* from Cape Cod and The Islands, *Isotria medeoloides* from Hampden, Worcester, and Essex Counties, *Moehringia (Arenaria) macrophylla* from Berkshire County, *Cardamine longii* from Plymouth County, *Vaccinium vitis-idaea* and *Blephilia hirsuta* from northern Berkshire County, and *Symphoricarpos albus* from Franklin County.

Land use statistics show that Massachusetts has far more forested land today than 150 years ago, despite the building boom. Rare species reflect this trend. Of the 43 taxa which today are considered extirpated from the state, at least 31 inhabit early successional environments, habitats which were widespread across the state when most botanical collecting was done. Analyses of whether "missing" species are of northern, southern, or western biogeographical affinities have been inconclusive and show no definite trends, which is to say that there appears to be an across-the-board loss of species, regardless of geographical origin. Similarly, of the ten new species discovered in the state, five may be classed as northern and four as southern.

Since the inception of the Natural Heritage Program, we have come a long way in terms of recognizing what are the most important plant communities in the state, where they are located, and how they are threatened. At the top of the list are the coastal heathlands of Nantucket, the alkaline fens of Berkshire County, the Coastal Plain ponds of Plymouth and Barnstable Counties, and pine barrens wherever they are. We continue to actively search out areas of ecological importance as the key to the survival of rare taxa.

Turning to protection activities, there are four basic strategies employed. First, the Natural Heritage Program is part of the statewide environmental review process, coordinated by the MEPA (Massachusetts Environmental Policy Act) and DEQE (Department of Environmental Quality Engineering, which administers the state Wetlands Protection Act) offices. Comments are prepared on over 1400 development projects annually, resulting in various amounts of mitigation but rarely leading to land acquisition or conservation easements. In the absence of any statewide legislation which specifically protects plants, the environmental review process is a positive step toward protection.

Second, the Natural Heritage Program operates a Public Reg-

istry Program, which informs federal, state, and municipal agencies of rare species sites and works with them toward protection via habitat management, designation of unique natural areas, and inclusion of sensitive areas in long range planning documents. Some 170 properties have been targeted and are in various stages of implementation.

Third, The Nature Conservancy operates a Private Registry Program, which informs private landowners of rare species sites that have been identified by the Natural Heritage Program. To date 93 sites across the state have been protected, using a broad spectrum of protection techniques ranging from verbal agreements by the landowners to outright purchase of the parcel. Follow-up visits by TNC or MNHP staff help ensure that landowners are fully aware of our interest and commitment, and at the same time allow us the opportunity to negotiate for the level of protection deemed necessary for each parcel. As land prices have soared in the state, these two Registry Programs have become essential tools in rare species conservation.

Fourth, there is now in place a tax checkoff system in Massachusetts. For five years generous citizens have contributed money to a nongame wildlife fund administered by the Division of Fisheries and Wildlife. These monies have been and will be used primarily to purchase rare species habitat and to fund research on rare species through a Small Grants Program. A half-million dollars was raised during the 1986/87 tax season.

Through these various efforts, 182 rare species now enjoy some form of protection in the Commonwealth. This number represents 92% of the species for which we have current stations. However, in many instances we have not progressed beyond landowner contact; our goal now must be to afford these species stronger protection wherever possible via land acquisition and designation of unique natural areas.

LITERATURE CITED

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